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NEXUS ACCELERATION

Results of the Water Energy Food Security Startup Acceleration Programme in the Niger Basin

SEPTEMBER 2023

2iE Institut International D'Ingénierie de l'Eau et de l'Environnement

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

NEXUS ACCELERATION.
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Published by the Nexus Regional Dialogues Programme

c/o Deutsche Gesellschaft für Internationale
Zusammenarbeit (GIZ) GmbH
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This publication was produced with the financial support of the European Union and the German Federal Ministry for Economic Cooperation and Development. Its contents are the sole responsibility of GIZ and do not necessarily reflect the views of the EU or the Federal Ministry for Economic Cooperation and Development.

The Nexus Regional Dialogues Programme is funded by the European Union and the German Federal Ministry for Economic Cooperation and Development.

Place and date of publication
Bonn, 2023

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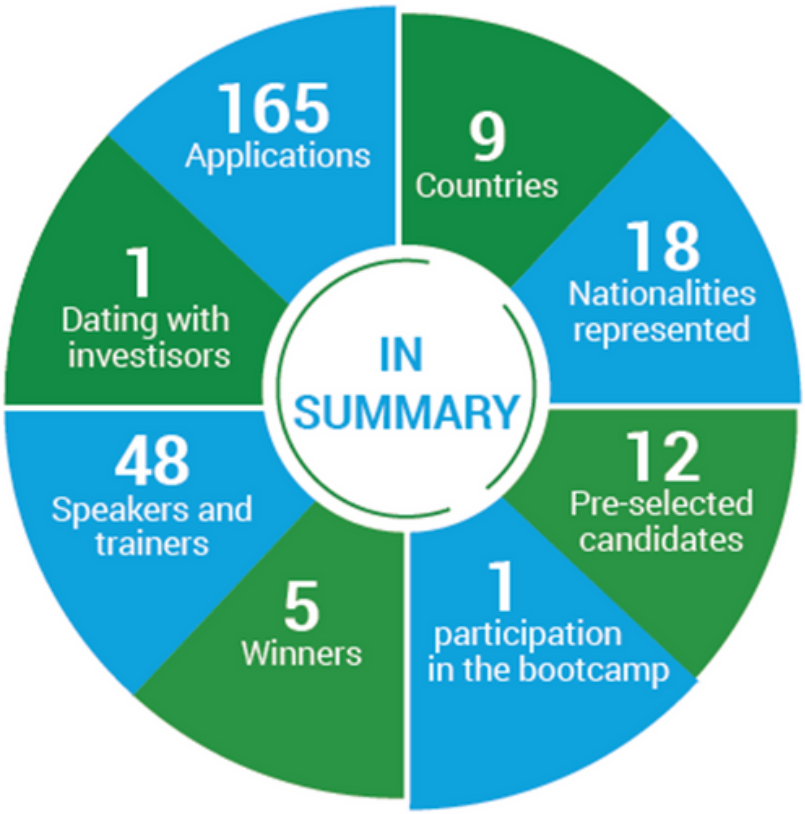
SUMMARY

The Niger Basin region is facing a tremendous challenge in securing energy, food, and water for its 160 million inhabitants. Due to climate change, rainfall variability will lead to longer dry periods in the region. Rainfall intensity and extreme flooding events are likely to increase. Rapid population growth and urbanisation heighten the demand for electricity, clean drinking water and food. The Water-Energy-Food (WEF) Nexus approach addresses this complex reality and recognises that water, energy and food security can only be achieved through safeguarding, protecting and upholding natural resources. For this, it needs appropriate, innovative, and sustainable solutions from the region. This includes start-ups with a strong social and environmental impact.

From 2021 to 2023, the Water-Energy-Food Security Nexus Regional Dialog in the Niger Basin programme partnered with the Institut International d'Ingénierie de l'Eau et de l'Environnement (2iE) to support start-ups in the WEF Nexus field in the Niger Basin region. It is funded by the European Union and the German Federal Ministry for Economic Cooperation and Development.

The WEF-Nexus Accelerator programme built upon 5 core activities:

1. Identification and recruitment of **5 WEF Nexus high-impact start-ups**: definition of eligibility and selection criteria, launch of the call for applications, organise a one-week bootcamp and select the final 5 winning start-ups;
2. **Acceleration of the 5 winning start-ups** from the bootcamp: positioning, technical and legal coaching, updating the business model, measuring ESG impacts and defining an occupational health and safety policy, optimizing products/improving service offerings;
3. Prepare **due diligence assessments** for valuing start-ups with investors;
4. Meeting with **impact investors** interested in the Nexus WEF field;
5. **Capitalization**: monitoring, difficulties encountered, lessons learned.



This booklet is intended to give an overview of the activities performed by the 2iE institute in collaboration with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and present the **five accelerator start-ups:**

Agro Eco Services (Benin)

Specializing in the production of organic fertilizers, the start-up provides an environmentally sound solution to the problem of urban organic waste management and declining soil fertility in Africa, thanks to a subtle combination of biochar and fertilizer in its products.

Clean Energy Services (Cameroon)

The start-up develops solar thermal and photovoltaic energy solutions for preserving heat-sensitive products and powering farm machinery. It promotes a circular economy by giving new life to freezer carcasses, thus avoiding emissions of Chloro Fluoro Carbides (CFCs).

Green Business Consulting (Niger)

The start-up produces and markets green charcoal for cooking, biochar, and organic fertilizers through the pyrolysis of water hyacinth and typha as well as organic residuals.

MoonsofBio (Guinea)

The company specialises in manufacturing intelligent biodigesters from plastic materials collected and recycled in the city of Conakry. Through this project, it offers households, farmers, schools, and restaurants a biodigester that transforms their biodegradable waste into methane and fertilizer.

SAVIP (Chad)

The Sanitation and Clean City Service (SAVIP) initiative provides residents with a low-cost collection and management service for plastic and organic waste. It contributes to the collection and recovery of waste, the reduction of GHG emissions, the preservation of water quality and, therefore, the reduction of water-borne diseases.

1 WEF Nexus Accelerator Programme for Niger Basin start-ups

The world is currently facing a great challenge: to ensure the supply of water, energy, and food for all while natural resources are limited due to increasing needs related to rapid population and economic growth, accelerated urbanization, and changing lifestyles.

The Institut International d'Ingénierie de l'Eau et de l'Environnement (2iE) has organized a Water-Energy-Food Security Accelerator Programme in cooperation with the GIZ Nexus Regional Dialogue Programme co-financed by the European Union and the German Federal Ministry for Economic Cooperation and Development. The Nexus Regional Dialogue Programme supports the Niger Basin Authority (NBA) to promote the management of water, energy and food resources in a sustainable way and to identify innovative and bankable solutions in the 9-member countries of the Niger Basin (Benin, Burkina Faso, Cameroon, Chad, Ivory Coast, Guinea, Mali, Niger, and Nigeria).

As the major river in West Africa, the basin of the Niger River and its ecosystems provide the foundation for the everyday activities and livelihoods of around 160 million people. The river provides drinking water, hydropower generation, irrigated agriculture, cattle breeding, fishing and transportation – making it the élan vital of the nine riparian countries.

The objective of the Accelerator Programme was to identify and speed up high-impact WEF (or similar) startups and support the fundraising for them. Such startups bring the right solutions to problems like how to provide energy, water and food needs of populations in a sustainable way without harming the water and environmental systems we depend on.

Prior to the start of the acceleration programme, a Water-Energy-Food Security Nexus Bootcamp took place between June 26 and July 2nd 2022, at the 2iE campus in Ouagadougou, Burkina Faso. It was co-organised by the Nexus Regional Dialogues Programme and the 2iE Institute, and gathered 12 entrepreneurial projects from the nine NBA member states. Each project had the chance to present their business models and ideas. The objective of the bootcamp was to provide training and individual coaching for the participants to further develop their business and link them with potential investors.

1.1 Selection of participants

The call for applications was launched from March to April 2022 in all 9 Niger Basin member states. 160 innovative young companies from Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Guinea, Mali, Niger, and Nigeria replied to the call for application to participate in the accelerator program. The competition was open to any small and medium enterprise (SME) which has been in business for more than two years and whose main promoter is a citizen or resident of the member states of NBA. The 12 best start-ups with one champion from each member state country have been chosen by using the Water Energy Food Nexus selection criteria toolbox. It identifies projects creating positive synergies between the three sectors (water, energy, food) without negatively impacting each other (see box)

Box: Eligibility and Selection crtiteria

The Competition has been open to any startup formally created and operating in one of the NBA member countries and which met the following requirements:

- Established after January 1, 2018;
- Be (the lead promoter) a citizen or resident of an NBA Member Country;
- he startup creates (or has the potential to create) positive synergies between, at least, two of the three sectors (water, energy, food) without negatively impacting the third dimension OR
- the startup limits negative impacts on, at least, two of the three sectors (water, energy, food);
- Be driven by an entrepreneurial spirit;
- Commit to be available for the duration of the program and to follow the coaching program (May 2022- January 2023);
- Submit only one project for the competition.

As for the evaluation of applications, it will be based on the following criteria :

- Relevance, appropriateness, and innovation of the proposed solution;
- Quality of the implementation team;
- Motivation of the promoter;
- Relevance of the technical-commercial feasibility;
- Potential for the financial viability of the startup;
- Relevance of the startup's development strategy;
- Relevance of the link with the WEF Nexus (water, energy, food);
- Relevance of the social and environmental impact;

1.2 Thematic foci of contestants

The contesting entrepreneurial projects were selected based on how well their business models focused on different integrated aspects of the WEF Nexus, with particular interest in technologies such as solar power solutions, natural fertilizers, and digitalisation.

Below are some examples of the portfolio of the start-ups during the bootcamp:

- Recovering agricultural waste to produce natural fertilizers and biochar;
- Manufacturing and installing solar-powered products (e.g. refrigerators, solar irrigation kits);
- Running a digital platform for crowdfunding and technical support for agricultural projects;
- Designing and selling smart biodigesters;
- Processing downgraded or rotten fruits and vegetables using solar energy and biomass from agricultural waste;
- Marketing of digitalisation system for poultry farming and agriculture;
- Production of green charcoal, biochar and organic fertilizer from water hyacinth;
- Marketing of sustainable mechanical means which reduce post-harvest losses;
- Operating an integrated agro-fish farm using a solar-powered borehole

1.3 Programme of the bootcamp

The bootcamp was a 5-day long series of workshops in June 2022 to train the contestants on how to build a successful business model, enter the market, what are expectations of investors, and how to create an impactful pitch to a jury. In a Q&A session with investors the participants discussed important aspects of fundraising and engaging with investors. Everyone received 1-on-1 coaching sessions with laboratory experts and mentors from 2iE.

On the last day, every start-up held a pitch to a jury, which consisted of a mix of different members, from investors, scientists, media experts and entrepreneurs. It also included another programme partner, namely the Foundation Res4Africa, which focuses on how to demonstrate the economic value of Nexus projects to public and private investors, and how to mobilize the financing necessary for their implementation (see their publications Financing the Water Energy and Food Nexus & Designing innovative solutions for the Water, Energy and Food Nexus).

As a side-activity, the participants together with students from 2iE engaged in a serious Nexus Game simulation on the management of natural resources in a transboundary river basin context to better understand the interlinkages between the water-energy-food security sectors. After the game, the project handed over two complete versions of the Game to the institute, which will integrate it into their upcoming curriculum.

1.4 Acceleration program

Aside from its didactic goal to provide training and mentoring to the participants, the bootcamp was also a real competition. The top 5 entrepreneur finalists received the opportunity to take part in a 9-month long acceleration program which aimed to further develop their business, as well as to connect them with public and private investors interested in financing WEF Nexus-related start-ups.

The top 5 start-ups were (in alphabetical order):

Agro Eco Services (Benin)

Specializing in the production of organic fertilizers, the start-up provides an environmentally sound solution to the problem of urban organic waste management and declining soil fertility in Africa, thanks to a subtle combination of biochar and fertilizer in its products
Your paragraph text

Clean Energy Services (Cameroon)

The start-up develops solar thermal and photovoltaic energy solutions for preserving heat-sensitive products and powering farm machinery. It promotes a circular economy by giving new life to freezer carcasses, thus avoiding emissions of Chloro Fluoro Carbides (CFCs).

Green Business Consulting (Niger)

The start-up produces and markets green charcoal for cooking, biochar, and organic fertilizers through the pyrolysis of water hyacinth and typha as well as organic residuals.

MoonsofBio (Guinea)

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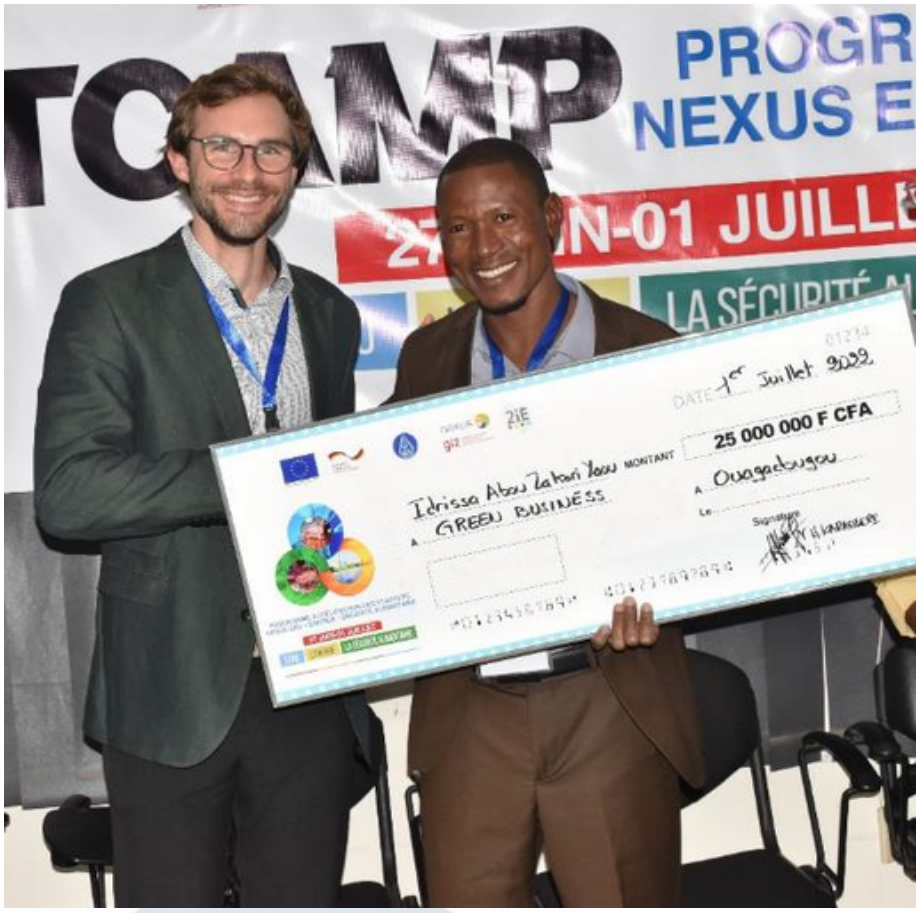
SAVIP (Chad)

The Sanitation and Clean City Service (SAVIP) initiative provides residents with a low-cost collection and management service for plastic and organic waste. It contributes to the collection and recovery of waste, the reduction of GHG emissions, the preservation of water quality and, therefore, the reduction of water-borne diseases.

By the end of the bootcamp, the jury selected the winning candidate based on their pitches. The first place consisting of a seed funding of 25,000,000 CFA was won by Zakari Idrissa representing Niger, whose start-up **Green Business** uses water hyacinth to produce green biochar and organic fertilizers which reduces deforestation and improves the water storage in the soil.



2 Profiles and journey of the five startups

The following chapter presents the five startups in more detail and tells how they developed their business during the accelerator programme.

2.1 Agro-Eco Services

2.1.1 Profile

Noël OBOGNON is a young entrepreneur-researcher expert in soil fertilisation and plant nutrition from Benin. In 2019, the 31-year-old man founded the cooperative company AGRO-ECO SERVICES (AES) specialised in the production of organic fertilisers using Black Fly Soldiers, which reduces the composting time of organic residuals to 12 days. This innovation provides an answer to the problem of declining agricultural yields and soil fertility in Africa through a clever combination of biochar/fertiliser and urban organic waste management. Marketed under the "Maggot-Compost" label, the produced fertilizer retains water and minerals, which are necessary for the plant and sustainably fertilizes the soil and increases the yield of producers. Through this innovative project, AES has won the Young Innovative Entrepreneur Award in Land Restoration organised by The Land Accelerator in Kenya in 2021; it is also the winner of the Challenge des 1'000 of the Africa-France Summit in Bordeaux in 2020; of the Young Innovative Entrepreneur Award of West Africa organised by RUFORUM in Cape Coast, Ghana in 2019; and the winner of the 1000 Young Entrepreneurs of Africa competition organised by the Tony Elumelu Foundation in 2019. The vision of AES by 2030 is to make African countries and Sahelian countries in particular, agricultural countries based on a rational, healthy and sustainable exploitation of their soils, thus contributing to the development of agricultural producers, the protection of the environment, the nutritional, economic and socio-cultural well-being of its populations.

2.1.2 Acceleration journey

From research to entrepreneurship

Based on the results of his Master's research, Noel Obognon, succeeded in reducing the composting time of organic waste from 45 days to 12 days thanks to a technique that uses black soldier flies as decomposition agents. By combining biochar and compost, the Maggot-compost formulated and marketed by Agro-Eco Services contributes to the management of urban organic waste while providing an answer to the problem of declining agricultural yields and soil fertility in Africa.

With the use of black soldier flies, Agro-Eco Service obtains compost in short production cycles and has managed to process approximately 200 tonnes of organic waste in 2021. With an average fertiliser production of about 11 tonnes/month, Agro-Eco Service is now the second largest producer of organic fertiliser in Benin.

Thanks to its young and dynamic team (8 permanent and 12 temporary staff), the startup has been supporting and supplying nearly 2,000 market gardeners and 500 small-scale organic pineapple producers since 2019. The use of Agro-Eco Services' organic fertilisers has enabled producers to double or even quadruple their yields of vegetables and amaranth leaves.

For the next few years, Agro-Eco Service aims to position itself as the main supplier of green manure to organic pineapple growers in Benin.

2.1.3 Challenges and prospects

During its acceleration at the 2iE Institute, Agro-Eco Service benefited from the expertise of the Laboratoire Eaux Hydrosystèmes et Agriculture (LEHSA) and the Laboratoire d'Energies Renouvelables et Efficacité Énergétique (LabEREE) for the certification of its fertilizers and the optimization of its production process. In the short term, this support will enable the technical data sheets for the fertilisers to be drawn up and in the medium term to considerably reduce production costs and increase the startup's margins.

"Optimization

By characterising its raw materials, Agro-Eco Services has now detailed technical data sheets for each of the products it markets. Thanks to its new strategy for collecting raw material supply, which considers availability, accessibility and, above all, purchasing costs, the start-up has been able to reduce its production costs and increase its profit margins. It has also been able to improve the operation of its traditional pyrolizer by developing a prototype that optimises air inlets.

Due to this new version of the pyrolizer, Agro-Eco Services has increased its carbonisation yield from 7 % to 18 %, and its production capacity from 20 to 30 tonnes per month. With a new profit margin of an additional 10 %, the kilogram (kg) of "Maggot-Compost" sold on the market decreased from 200 CFA franc/Kg (~ 30 cent EUR) to 180 CFA franc/Kg. In the long term, the start-up plans to move to semi-industrial production by acquiring a pyrolyser with a carbonisation capacity of 500kg per day, compared to 40kg per day of the current system. The start-up aims to market 100 tonnes of fertiliser per month by 2026. Through the Support Project for the Development of Market Gardening in Benin (Projet d'Appui pour le Développement du Maraîchage au Bénin, PADMAR), Agro-Eco Services benefits from partnerships to open sales outlets for its fertilisers throughout the country.

The company's business plan is currently being updated, along with a communication and awareness-raising strategy to encourage farmers to use organic fertilisers. Another goal of the start-up is to maximise its communications on digital platforms to reach more target audiences.

Towards certification of its fertilisers

The start-up has embarked on the ECOCERT certification process in line with the requirements of the European Union (EU) standard 2018/848, in order to guarantee its customers authentic, high-quality products. Once this recognition has been obtained, it will be able to conquer both the national and international markets. Agro-Eco Services has now a fund-raising strategy and is being supported by 2iE's Incubation and Entrepreneurship Centre (CIE) to carry out due-diligence to strengthen its position in the eyes of future investors.

2.2 Clean Energy Services

2.2.1 Profile

Triomphant TCHULANG is a design engineer in Renewable Energies, an African player in the energy transition and a specialist in photovoltaic and solar thermal energy. After graduating from the École Nationale Supérieure Polytechnique de Maroua in the Sahelian region of Cameroon, he embarked on entrepreneurship and in 2015, alongside his friends, created Clean Energy Services, a company specialising in the design, installation and maintenance of solar systems. He and his team developed the first ever PVT (Photothermal or Bisolar-Tech Fridge) solar refrigerator model without a storage battery, in order to meet the need for cold storage of food, vaccines and other pharmaceutical products (e.g. Astrazeneca) in isolated areas 24 hours a day. This innovation has enabled it to be a finalist at the Sustainable Energy for ALL (SE4ALL) in 2021, to win the DOW CHALLENGE in 2021 in Dakar, to be the winner of the challenge of 1000 African entrepreneurs in 2020 and to obtain the Jury's Favourite Award at the grand final in Paris of the EDF PULSE AFRICA Award 2019.

2.2.2 Acceleration journey

"Battery-free solar freezers to reduce post-harvest losses in the Sahel

Clean Energy Services is a young Cameroonian startup whose mission is to develop energy and solar solutions (solar pumps, aquaponics, solar coolers) to increase agricultural production and reduce post-harvest losses in rural and peri-urban areas in the Sahel. Its main products are the "Bi-Solar Tech Fridge" and "Bi-Solar Tech Freezer", a solar refrigerator and freezer without battery storage. They combine solar thermal and solar photovoltaic energy for the conservation of food, vaccines and other heat-sensitive products in areas with low electrification rates. GIZ is supporting Clean Energy Services for the scale-up of its freezers, in the framework of the WEF - Nexus Acceleration Program implemented by the 2iE Institute.

Engineering for food security in the Far North of Cameroon

In 2020, Triomphant Tchulang and two other energy engineers from the Polytechnic Institute of Maroua, embraced the challenge of combining solar thermal energy and solar photovoltaic energy to produce the first solar-powered refrigerators and freezers without the need for storage batteries. In the absence of conservation and processing methods for food products, the Bi-Solar Tech Fridge/Freezer contributes to the reduction of post-harvest losses, estimated at nearly 40%, in the Sahelian region in the Far North of Cameroon. These losses threaten food security in the region, which already faces the challenges imposed by the harsh climate and invasions by migratory birds and insects.

A second life for freezers and a gesture for the ozone layer

At the beginning of the Bi-Solar Tech Fridge/Freezer manufacturing process, used freezers at the end of their life were destined for the landfill and abandoned. Clean Energy Services recovers these freezers, stripping them to separate the reusable parts to produce new freezers (carcass and insulation system), from the non-usable parts. For each recycled freezer produced, Clean Energy Services reuses an average of 85 to 90% of the mass of the used freezers (27 to 60 kg of scrap metal depending on the volume and model of the freezer) and saves 0.8 to 1 kg of chlorofluorocarbons (CFCs) from landfill. These refrigerant gases found in the compressors of freezers have a warming power of 5000 to 14000 times more dangerous than CO2, besides contaminating soil and water.

Born from the dream of 3 young engineering students, Clean Energy Services team is now composed of 13 permanent employees and has a production capacity of one freezer per month. For the next few years, Clean Energy Services aims to industrialize its manufacturing process in order to increase production and efficiency, while satisfying its customers. This scaling up will allow the startup to make solar freezers available to the population all around the year, contributing to preserve hundreds of tons of fruits and vegetables in the Sahel as well as to protect the ozone layer

2.2.3 Challenges and Perspectives

During the acceleration program, Clean Energy Services is supported in the optimization of the operation of its solar freezers, the development of a solution for the management of CFCs and Hydrochlorofluorocarbons (HCFCs) and the optimization of the environmental impacts of its activities.

The start-up Clean Energy Services is currently further working to materialise its vision of meeting both energy and solar needs. The start-up has increased the number of employees from eight to 13, with a total of four women and nine men. Since the acceleration phase, it has improved its production processes and restructured its team. For instance, the start-up's flagship product, the "Bi-Solar Tech Fridge", incorporates a simpler and more resilient food preservation method. Its new device does not require the use of chemicals such as molten salts, sodium and potassium nitrate. With the new optimisation of the "Bi-Solar Tech Fridge" operating system, Clean Energy Services is saving up to 130,000 CFA (corresponding to around 195 EUR) francs on its production costs, thereby helping to reducing its ecological footprint.

The start-up has also implemented an ‘Occupational Health and Safety’ policy to ensure a safe working environment for its employees. It has adopted several preventive measures and prepared hazard maps, codes of conduct, permanent intervention plans and introduction programmes. All these elements are part of the equipment acquisition for the setting up of its industrial fridge production unit.

Ongoing projects

Within the framework of the Acceleration Programme, Clean Energy Services plans to equip groups of vulnerable women and young people with solar fridges. The project reaches out to around 20 women and young people who live mainly from fishing and fish trading in the far north of Cameroon. The project will enable its beneficiaries to better preserve their food and sell fresh food products.

With a growing customer portfolio, Clean Energy Services aims to reach a production capacity of 20 fridges per day by March 2024, supplying Cameroon and neighbouring countries in Central and West Africa. Almost 80,000 households in sub-Saharan Africa will be able to use the ‘Bi-Solar Tech Fridge’ to better store and preserve their food.

2.3 Green Business

2.3.1 Profile

Zakari IDRISSA ABDOU is a young Nigerien entrepreneur, 32 years old, who graduated from the UAM of Niamey in Geoscience and Environment. In response to the proliferation of water hyacinth on the Niger River and the disappearance of aquatic fauna, he founded Green Business Consulting in 2020, a startup company producing and marketing green charcoal for cooking, bio-char and biological fertilizer by pyrolysis of water hyacinth. Through this project, Green Business Consulting contributes to the preservation of the Niger River, the reforestation and improvement of soil fertility in Niger and the protection of groundwater. Through the production of green charcoal, the project will partly meet the energy needs of households.

2.3.2 Acceleration journey

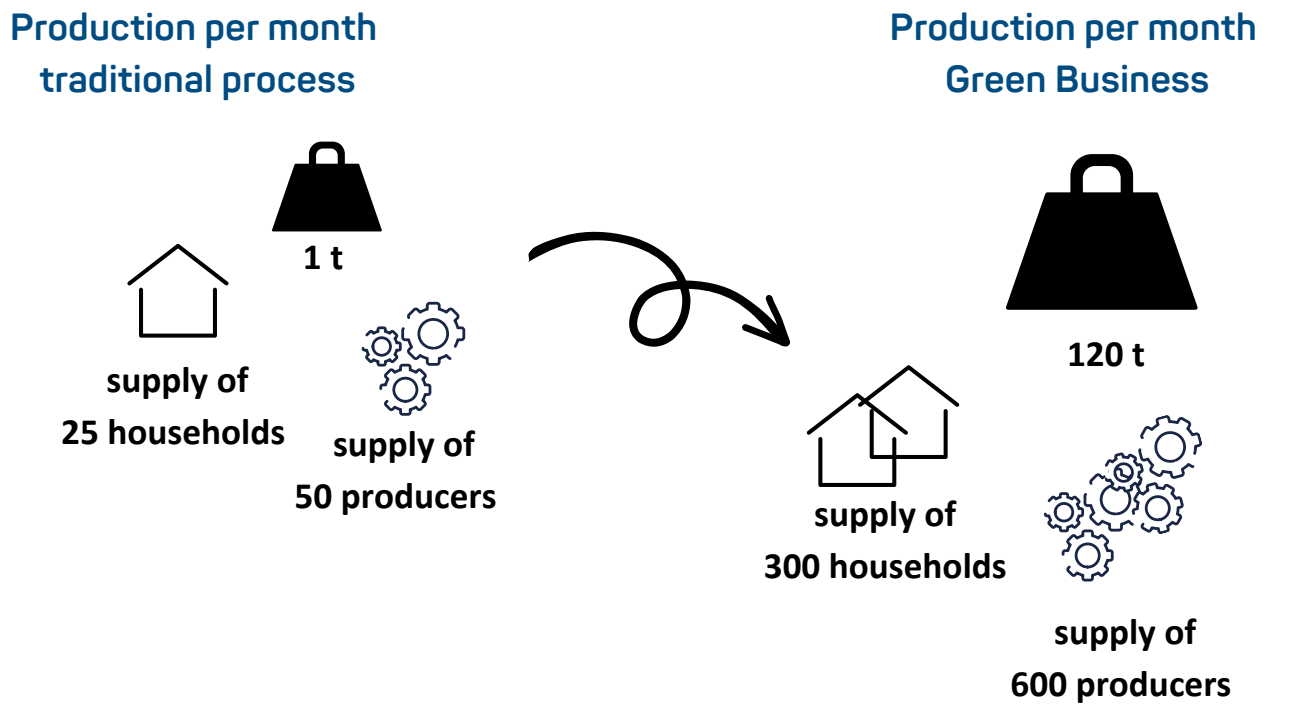
The Nigerien start-up Green Business Consulting is contributing to meet household energy needs and restore soil fertility. It markets green coal, organic fertiliser and biochar, products derived from the processing of various plants invading the Niger River. To meet the growing energy and food needs of the local population, Green Business Consulting is carrying out the mechanisation of its production line

The seed funding of 25,000,000 CFA francs received by Green Business Consulting under the Water-Energy-Food (WEF) Security Nexus Acceleration Programme has enabled the start-up to transition from small-scale to semi-industrial production. The company acquired own land with the support of the government of Niger to build a new production facility. The production site is in the department of Kollo close to the capital of Niamey, in the green region of the country, just a few kilometers from the Niger River. This strategic location brings the start-up closer to the collectors of the raw materials it uses (water hyacinth and typha) and the consumers of its products (farmers and rural households). This close proximity significantly reduces the cost of transporting raw materials and finished products and helps to increase the start-up's profit margin.

Equipment acquired for scaling up

As part of its expansion plans, the start-up has hired staff for its new production line. The number of employees increased from twelve to 17 employees (seven temporary and ten permanent). Idrissa Abdou Zakari, Chief Executive Officer (CEO) of the start-up, explains,

> *"Instead of traditional carbonisation, the industrial carboniser that Green Business Consulting acquired enables uniform carbonisation of the raw materials used in the manufacturing process. Moreover, most other operations, which used to be done manually, have also been mechanised. Water hyacinth, typha and rice straw, the main raw materials used, can now be shredded with the straw grinders. The pellet machine shapes the compost into uniform pellets, and the briquette press enables the production of biochar that is more resistant to impact and less fragile."*



With this production line, the start-up Green Business Consulting will be able to produce 120 tonnes of green coal per month, compared to one tonne per month with the traditional process. As a result, the start-up will be able to supply 300 households and 600 producers, instead of the previous 25 households and 50 producers.

The lessons learned during the Acceleration programme have led Zakari to broaden the vision of the start-up. He has been supported in creating several management documents, including a raw materials collection strategy, an updated business plan, a formalised production process, and production protocols. All of these developments have strengthened the start-up's expertise, both nationally and internationally, and expanded its range of opportunities.

Also, through the acceleration programme, Zakari has created new partnerships that will enable him to increase his financial strength. In the long term, the CEO aims to produce 500 tonnes of fertiliser per year and 240 tonnes of charcoal per year.

Currently, the start-up is planning a certification process to guarantee that its customers receive products that meet international standards. Zakari, the CEO of Green Business Consulting, benefited from tailor-made support that enabled him to optimise the mode of governance of his start-up, measure the start-up's social and environmental impact, and develop a fundraising strategy. The various technical, managerial and structural changes made within Green Business Consulting have strengthened the start-up's positioning vis-à-vis its partners and potential investors.

The start-up is now one of the service providers selected as part of the African Biodigester Component (ABC) project implemented by the Netherlands Development Organisation (SNV). To meet household energy needs and supply fertiliser to agricultural land, the service providers of the ABC project are expected to install 4,000 biodigesters in Niger between 2023 and 2025.

As a final activity of the accelerator programme, Zakari participated in a decisive event organised between start-ups and impact investors in Abidjan, from 22 to 24 May 2023. It was a great opportunity for him to present the achievements of Green Business Consulting, showcase their expertise and outline their ambitions and perspectives. Discussions are ongoing with the investors who attended the event.

"It was a very special meeting where we had the opportunity to talk at length with the investors who attended. They were honest and open with us and shared important experiences that will help us improve our future fundraising initiatives. It was a real meeting of giving and taking", Zakari says with satisfaction.

New partnerships

The programme provided Green Business Consulting with visibility that allowed to attract a number of strategic partners. The start-up currently has a private production site where its new semi-industrial production line is being installed. This has been possible because of the financial support provided by the Nigerien government through the National Support Fund for the Promotion of Entrepreneurship (Fonds National d'Appui pour la promotion de l'entrepreneuriat, FONAP). These funds were invested in the purchase of the land, in the ongoing costs of technical, managerial and structural reinforcement, and the installation of machinery acquired with the support of the Nexus Acceleration Programme

Additionally, Green Business Consulting has been identified and will receive financial support from Niger's Agency for the Restructuring and Upgrading of Industries (Bureau de Restructuration et de Mise à Niveau des Industries, BRMNI) to accelerate its transition to scale. Through this support, a study will be conducted on the needs of the start-, and its results will determine the financial package to be granted.

2.3.3 Challenges and prospects

Since starting the acceleration programme, the startup has been able to activate growth levers for scaling up and industrialising its production line. Given the growing demand and needs of its customers, the start-up is now approaching major investors for financial alliances. Green Business Consulting is currently carrying out a due diligence process, which will help to raise the start-up's profile with investors and strengthen its position in the Nigerien market.

2.4 MoonSoftbio

2.4.1 Profile

Gbadé KOIVOGUI is a young Guinean entrepreneur and designer. Gbadé graduated in 2018 with a Master's degree in Electronics and Embedded Systems from the Kofi Annan University of Guinea. From the beginning of his career, Gbadé has focused on issues of technology transfer and tropicalised energy solutions. From 2017 to 2018, he held the position of Technical and Innovation Manager at Magoe Technologie SARL. In May 2019, he decided to set up his own business and became co-founder of MOONSOFT Bio, a startup that valorises recycled materials (plastics and scrap metal) in the design and manufacture of smart bio digesters. Through this project, MOONSOFTBio offers households and collective catering establishments a system for managing their biodegradable waste, substitutes charcoal with methane for clean and sustainable cooking and promotes aquaponics and urban agriculture through the production of liquid and solid fertilisers.

2.4.2 Acceleration journey

To address increasing challenges of energy scarcity, deforestation, waste proliferation and food insecurity in Africa, Moonsoftbio, a young Guinean start-up, markets autonomous, intelligent bio-digesters to manage fermentable waste. In this way, it contributes to maintaining a healthy environment in Conakry and its surrounding area.

Designed by Gbadé KOIVOGUI, founder of Moonsoftbio, the intelligent bio-digester has a monitoring system that makes it easy to control and monitor the system remotely. Made of plastic and scrap metal, the bio-digester is waterproof, durable and resistant to organic acids. With almost 3,300 tonnes of human and organic waste generated daily in Guinea, the solution is designed for households, schools, restaurants and farms. Depending on the average amount of waste produced, Moonsoftbio offers four types of bio-digester with capacities ranging from 500 to 2,200 litres.

The advantages of this solution

The decomposition of waste by the bio-digester produces methane and organic fertilisers, which have environmental, economic and health benefits. The methane produced replaces the use of wood/charcoal, reduces dependence on fossil fuels and logging, and meets people's energy needs. Depending on the capacity of the bio-digester and the volume of gas stored, the methane can be used for between three and five hours per day.

With the fertilisers produced by the bio-digester, Moonsoftbio is having an impact on the agricultural sector and is helping farmers to transition to more environmentally friendly production systems. These fertilisers, which replace chemical fertilisers, help to empower producers, increase agricultural productivity, improve public health and enhance food security. To meet the demand for fertilisers, in addition to its own production, the start-up has made its customers privileged allies, from whom it buys the fertiliser produced by the bio-digesters.

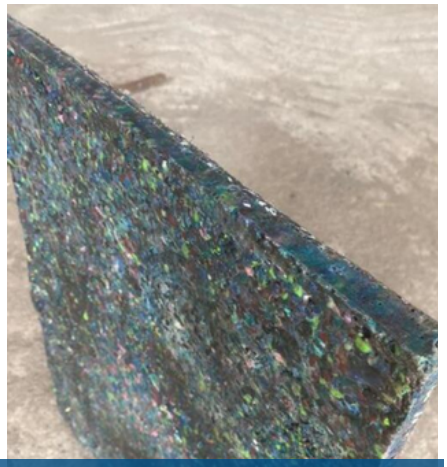
To optimise the use of liquid fertiliser, Moonsoftbio also offers an aquaponics kit for soil-less production in urban areas. Using minimal space and water, this kit is suitable for low-root crops such as lettuce, tomatoes, cucumbers, mint and strawberries.
In 2021-2022, Moonsoftbio sold five bio-digesters, 400 litres of fertiliser and 15 aquaponics kits, reaching 10 producers, 15 households and three catering businesses.

2.4.3 Challenges and prospects

Moonsoftbio is being supported to structure its production, improve its collection of raw materials and test new business models. The aim is to equip every school canteen in Conakry with a bio-digester for waste management.

As a beneficiary of the WEF-Nexus Acceleration Programme, Moonsoftbio receives support on technical and managerial aspects covering the optimisation of its production capacity, the operation of its biodigester models, the measurement of its social and environmental impact, and the production and commissioning of biodigesters for strategic objectives.

Moonsoftbio started with biodigesters made from scrap metal and plastic and has been offering prototypes made exclusively from plastic for the past few months. This new positioning better fits the start-up's vision, which is to contribute to the recycling of plastic waste in Conakry and the surrounding area.



The new types of Moonsoftbio biodigester are recyclable, corrosion-resistant and flexible. They require less maintenance and are designed to last for about 40 years. By integrating plastic polymers into the manufacturing process, the start-up has been able to reduce its production costs by almost 40%, and recycle about one tonne of plastic waste to produce four biodigesters. To support the supply of plastic materials, Moonsoftbio works with small and medium-sized enterprises (SMEs) and youth organisations in Conakry. These organisations provide the start-up with almost 28 tonnes of fermentable waste per month, from which it can produce 200 litres of fertiliser and compost.

The start-up is currently developing a mobile application exclusively for remote monitoring of biodigesters. The application will serve as a communication interface between customers and Moonsoftbio's technical team, from identifying faults to tracking requests, via user demos and product data sheets. It will also be used to coordinate maintenance work and customer service.

Towards responsible policies

Beyond profits, the start-up is not only concerned about the well-being and safety of its employees, but also about improving its environmental, social and governance (ESG) impacts. To this end, it has conducted a health and safety diagnostic, leading to the implementation of an occupational health and safety policy, the development of a risk map and permanent intervention and emergency plans. In terms of measuring ESG impacts, an assessment was carried out to identify the sources of impacts. This process led to proposed solutions for reducing the start-up's water and energy consumption and greenhouse gas emissions.

Moonsoftbio is working to improve its services offering and expand its customer portfolio with the expertise of 2iE's Centre d'Entrepreneuriat et d'Incubation (CIE). A project to install four biodigesters in a primary school is currently being implemented. The company's business model and business plan are also being updated to improve its positioning.

2.5 SAVIP

2.5.1 Profile

Originally from Chad, Djekourbouayom NGARNANG is a young entrepreneur specialising in the sociology of populations and development. Sensitized at a very young age to the social and environmental challenges faced by the Chadian population, he participates alongside communal associations and organizations in raising awareness and supporting vulnerable and internally displaced populations. In 2018, he created with friends the Association of Young Volunteers for Development and Environment within which they carry out voluntary activities in favour of the environment and the socio-economic development of young people. In the absence of an integrated waste management system in Chadian municipalities, the AJEVODE initiative has been replaced by the Service d'Assainissement et de Ville Propre (SAVIP) in 2020. Through the collection, transport and recovery of waste (plastic and organic), SAVIP aims to support town halls in their sanitation policy, to participate in raising awareness among the population, and to offer alternative products such as composts, feed, charcoal and paving stones. These solutions make it possible to clean up people's living environments, stop the spread of waterborne diseases, reduce the ecological footprint of human activities and contribute to poverty reduction.

2.5.2 Acceleration journey

SAVIP, Towards an improvement of collective sanitation in Doba-Chad

Created in 2020, “Service d'Assainissement et de Ville Propre” (SAVIP) is an initiative started by of Ngarnang Djekourbouayom, a young entrepreneur from Chad, in response to the problem of insalubrity faced by Chadian cities, Doba in particular. In the framework of the WEF-Nexus accelerarion programme, the 2iE Institute and GIZ are supporting and accompanying SAVIP to optimise its waste collection and management system.

A hygiene service that changes life in Doba

Waste management is a major global challenge for communities in large urban centers. For developing countries and Sub-Saharan African nations in particular, the waste management systems in place are quickly overwhelmed due to cities’ strong urbanization. Through its waste collection service, SAVIP is helping to create a healthier living environment for the population of the city of Doba, in southeastern Chad. The startup provides a solution to the problems of insalubrity and proliferation of clandestine dumpsites in urban areas, the propagation of disease vectors (harmful insects and rodents), the uncontrolled incineration of garbage, and the pollution of soil and water. Hence, SAVIP's initiative contributes to the prevention and reduction of amoebic dysentery, cholera and malaria, three widespread diseases in Central Africa which are associated to insufficient sanitation services and contaminated water sources.

Starting with a team of 3 people, SAVIP currently employs a dozen men and women for waste collection and transportation activities in the field. In two years, the startup reached more than 600 loyal subscribers, of which nearly 80% are households and 15% are businesses. With modest means of transport (rickshaws and tricycles), SAVIP manages to collect an average of 100 tons of waste per month. Garbage collection rates vary from 1,500 to 5,000 CFA francs (~ 2,30 – 7,60 EUR) per month, depending on the client category (household, business, administrative services, etc.), the frequency of collection and the type of waste.

Thanks to its teams, SAVIP actively contributes to raising awareness among Doba's population and introduces households and businesses to selective waste sorting operations, aiming at reducing contamination between types of waste and to facilitate downstream treatment operations.

In the short term, SAVIP plans to start recovering the collected waste for the production of compost and green charcoal that can be offered to farmers and households. During the first phase of its acceleration at the 2iE Institute, SAVIP worked on the characterization of the collected waste, the identification of available waste deposits and the implementation of a health and safety policy for waste collection teams.

2.5.3 Challenges and Prospects

During the final stage of its acceleration, SAVIP will benefit from technical training and coaching to effectively process the collected waste and produce green charcoal and compost for Doba population. In the long term, SAVIP will be able to expand to larger cities such as the capital N'Djamena and the city of Sarh.

3 Looking ahead

"Fund-raising: promising start-ups go head-to-head with impact investors

From 22 to 24 May 2023, business meetings and matchmaking between start-ups and investors interested in the Water-Energy-Food (WEF) Security Nexus were organised in Abidjan. The aim of this activity was to accelerate fundraising for these start-ups.

The three days enabled four start-ups benefiting from the WEF Nexus Programme and two additional start-ups supported by the Centre d'Incubation et d'Entrepreneuriat (CIE) of the 2iE institute to attract investors. All start-ups offer a range of solutions in renewable energy, sanitation, health and sustainable agriculture in Africa. The investors invited to the meeting were chosen for their interest in the WEF Nexus and the challenges facing people in the Sahel in general and the Niger Basin in particular.

Investment prospects

Reaching the end of their acceleration programme and with a high impact and increasing demand in the face of low production volumes, the start-ups are now looking for funding to scale up and meet the needs of the market. In-between exciting roundtable discussions and B-2-B exchanges, project leaders played their various cards and presented their solutions and growth perspectives to the investors of choice. Representatives from Barka Fund, Sahel Capital, and Dakar Network Angels (DNA) were among the investors who showed interest in the start-up projects.

Barka fund is an impact fund focused on African entrepreneurs taking measures to address urgent climate and environmental challenges in their communities. Barka supports their efforts to scale environmental and climate solutions and build sustainable companies.

The meeting helped accelerate the process of raising funds for the six start-ups present, while providing a setting for sharing best practices with investors. Topics discussed included identifying investors, analysing opportunities and the unspoken aspects of negotiations. The event ended with a shared satisfaction that paved the way for further exchanges and future alliances between the different actors.

Overall, the acceleration programme has helped the start-ups improve their business models and visibility to not only the target market but also potential investors. The start-ups still need to be more formalized and acquire the right certifications in order to attract investors and make investing proceedings easier. In this effect, the 2iE institute will continue to provide their support and expertise. It is hoped that these start-ups will serve as models in the various countries for more innovative and sustainable solutions to meet water, energy and food needs of populations in the sub-saharan region.